

2. On the Mammals presented by Allan O. Hume, Esq., C.B., to the Natural History Museum. By OLDFIELD THOMAS, F.Z.S.

[Received November 16, 1885.]

(Plates V. & VI.)

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tion, p. 72.

Accompanying the magnificent donation of Indian birds recently made to the National Museum by Mr. A. O. Hume, there is a collection of nearly 400 mammals, which, although appearing of small account beside the enormous ornithological series, is yet, viewed on its own merit, one of the finest collections of mammals ever received by the Museum. This is due not only to the large number of the specimens and the excellence of the skins, which are both in preparation and conservation very far above the average, but also to the careful manner in which they have been labelled, nearly all of them having their exact localities and dates recorded. Thus of the 371 specimens retained in the Museum, only 59 are undated, and only some 10 or 12 are without exact localities, while such large series of perfect skins, especially of the Squirrels and other small mammals, have probably never before been brought together.

The collection consists of a few specimens respectively from Simla, Delhi, the Nilghiris, and the Andaman and Nicobar Islands, but the great mass of it came from four separate localities, viz. Sambhar, in Rajpootana, Manipur, Tenasserim, and the Malay peninsula, and I have thought it better not to give one list of the whole, thereby confusing the localities and destroying any use the list might have for faunistic purposes, but to give four separate lists, each of which forms a distinct contribution to the fauna of a well-defined locality.

The total number of species represented in the collection is 106, of which 19 are from Sambhar, 19 from Manipur, 25 from Tenasserim, and 28 from the Malay peninsula, the remainder being from the other localities above mentioned.

Before commencing the detailed lists, I must express my obligations to Mr. W. T. Blanford for the assistance he has given me in working out this collection, an assistance the more valuable as he is himself preparing a work on the mammals of India, and has therefore the whole subject at his fingers' ends. For help also in making out details of localities, dates, &c. I must thank my colleague Mr. R. Bowdler Sharpe, who himself fetched the collection from Simla, and to whose careful packing the excellent condition in which the specimens now are is partly due.



J G Keulemans lith

Hankart imp.

MUS HUMII



J. G. Keulemans uth.

Hanhart 1886

SCIUROPTERUS DAVISONI

I. THE SAMBHAR COLLECTION.

The collection from Sambhar, Rajpootana, was formed in the winter of 1877-78 by Mr. R. M. Adam, to whom ornithologists are indebted for the "Notes on the Birds of the Sambhar Lake," published in 1873¹.

The interest possessed by such a series as the present consists in the aid it gives in fixing the north-westerly distribution of the commoner Indian mammals, a point on which we are as yet exceedingly ignorant, and for which authentic lists of the mammals of different localities are much needed. For this purpose Sambhar is an especially useful locality, as it is in this region that the fauna begins to lose its ordinary Indian character and to show signs of the desert influences so marked further west in Sind and the Punjab.

The collection consists of 42 skins referable to 19 species. The skulls have all been cleaned and sent separately, and too much credit cannot be given to Mr. Adam for the care and trouble he has taken in preparing this valuable part of his mammal collection.

1. FELIS CHAUS, Güld.

a. ♂. Sambhar, 2/2/78. *b.* ♂. Kishungurh, 26/12/77.

2. FELIS TORQUATA, F. Cuv.

a. ♀. Sambhar, 17/12/77.

3. FELIS ORNATA, Gr.

a-e, 4 ♂ and 1 ♀. Sambhar, 12/77 and 1/78. *f.* ♀. Kishungurh, 28/12/77.

Mr. Adam obtained no less than six specimens of this rare and beautiful species, which has been hitherto represented in the national collection by only a single half-grown individual collected by Capt. Boys, and by a skull from the Salt Range, obtained by Mr. Theobald. Mr. Adam's series is particularly valuable, as it proves incontestably the validity of the species, which has been confounded by Blyth, Jerdon, and others with *F. torquata*.

4. VIVERRICULA MALACCENSIS, F. Cuv.

a. ♂. Sambhar, 17/12/77.

This seems to be the most westerly Indian locality from which the Lesser Civet has been recorded, but the species turns up again on the other side of the Indian Ocean in Socotra, the Comoro Islands, and Madagascar, to all of which it has probably been introduced by natives.

5. PARADOXURUS NIGER, Desm.

a-c. Sambhar, 8 and 9/77.

¹ Stray Feathers, i. p. 361, 1873.

6. *HERPESTES GRISEUS*, Geoffr.¹
a-c. Sambhar, 1, 3, and 4/78.
7. *HERPESTES SMITHII*, Gray.
a. ♂. Sambhar, 13/1/78.
8. *HYÆNA STRIATA*, L.
a. Sambhar, 17/1/78.
9. *CANIS PALLIPES*, Sykes.
a. Sambhar, 23/1/78.
10. *CANIS AUREUS*, L.
a. ♂. Jodhpur, 28/1/78. b. ♂. Nawa, Sambhar Lake, 23/12/77. c. ♀. Goodha, Sambhar, 26/12/77. d. Sambhar.
11. *VULPES BENGALENSIS*, Shaw.
a. ♂. Sambhar, 17/1/78.
12. *VULPES LEUCOPUS*, Bly.
a-c. ♂. and 2 ♀. Sambhar, 9 and 12/77. d. ♂. Jodhpur. 26/1/78.
13. *MELLIVORA INDICA*, Bodd.
a. ♀. Sambhar, 14/1/78.
14. *SCIURUS PALMARUM*, L.
a. ♂. Sambhar.
15. *NESOKIA BANDICOTA*, Bechst.
a. ♂. Sambhar, 13/3/78.
16. *NESOKIA HARDWICKEI*, Gr.
a-e. 3 ♂. and 2 ♀. Sambhar, 6/77 and 1/78.

¹ There has been considerable diversity of opinion as to the name the common Indian Mongoose should bear, some authorities thinking the early name of *Viverra mungo* (Gmelin, Linn. S. N. i. p. 84, 1789) is applicable to it, and others that the *Ichneumon griseus* of Geoffroy (Descr. Egypte, Hist. Nat. ii. p. 133, 1812) includes an African as well as an Indian species, and is therefore not tenable. As to the first point, *V. mungo* was based by Gmelin primarily on the "*Viverra ichneumon* β" of Schreber (Säug. iii. p. 430, pls. cxvi. and cxvii. B). But the latter is made up of a conglomeration of different animals from various localities, the two plates representing, the first *H. griseus* and the second the South-African *Crossarchus fasciatus* (see P. Z. S. 1882, p. 91). In addition *Viverra mungo* includes *Herpestes persicus*, Gay. (= *H. auropunctatus*, Hodg.) as Mr. Blandford has pointed out (Zool. East Persia, p. 42, 1876). In my opinion therefore the only rational method of treating *Viverra mungo* is simply to ignore it altogether.

Passing to the second point, as to the applicability of Geoffroy's *Ichneumon griseus* to this species, I find that although Geoffroy quoted Buffon's "Neems" said to be East African, as identical with his animal, yet his description agrees in every respect with the Indian Mongoose, and he distinctly states that his species came from the "Indes Orientales," so that there is no valid reason why the time-honoured name of *Herpestes griseus* should be superseded.

17. *MUS RATTUS RUFESCENS*, Gr.

a. Sambhar.

Being now quite convinced of the specific identity of *Mus rattus* and *alexandrinus*, I use the Linnean name *rattus* in preference to that of *alexandrinus* provisionally employed in my review of the Indian Rats and Mice¹.

18. *HYSTRIX LEUCURA*, Sykes.

a. ♂. Sambhar, 27/1/78.

19. *LEPUS RUFICAUDATUS*, Geof.

a-c. Sambhar, 12/77 and 1/78.

II. THE MANIPUR COLLECTION.

The series from Manipur contains some of the rarest and most interesting of all the mammals presented by Mr. Hume, as was, indeed, to be expected, that country being as yet but little explored, and its mammal fauna being practically unknown. The collection consists of 61 specimens, belonging to 19 species, of which the greater part are decidedly Himalayan in character, the others being either peculiar to Manipur or only otherwise known from Burma. One species and one variety only are new to science, but many are rare and obscure, and all are of the greatest value as filling up an important gap in our knowledge of the fauna of Further India.

With regard to the smaller mammals also, collections from this region are of especial value, owing to the large number of Burmese species described by Blyth that still require proper identification. Notably is this the case among the Rodents, and it is with the greatest satisfaction that I am able to identify several of his species in the present and the Tenasserim collections.

The most important contributions to our knowledge of the mammal fauna of the Manipur region are :—

1. Blyth's posthumous "List of the Mammals of Burma" published as an extra part of J. A. S. B. xliii. 1875, which contains references to all the species then known to inhabit Burma, and in which the greater part of the species represented in Mr. Hume's collection are mentioned; and

2. Dr. Anderson's 'Zoological Results of the two expeditions to Western Yunnan,' 1878, which is less a list of the specimens obtained by the expeditions than a series of monographs of the chief Indian genera of mammals. These monographs, especially those of the *Sciuridæ*, have been of great value to me in working out the Hume collection, and I have made constant references to them throughout.

Mr. Hume has not as yet published his intended account of the Birds of Manipur, but when he does, he will no doubt give full particulars about the localities at which the mammals were obtained.

¹ P. Z. S. 1881, p. 533.

1. *HERPESTES AUROPUNCTATUS BIRMANICUS*¹, var. nov.²

a. Boori bazar, 11/3/81.

This specimen belongs to a race which for some time both Mr. Blanford and I have thought to be new, and of which the Museum possesses two other specimens, one from "Burma" (probably Tonghu) presented by Mr. R. G. Wardlaw-Ramsay and exhibited to this Society as *H. auropunctatus* by Mr. Alston in 1879³; and the other from Pegu (10/4/81) presented and collected by Mr. Eugene Oates. Mr. Blanford has also in his own collection a specimen of it from Cachar.

These four specimens are all nearly precisely alike and differ from ordinary Nepalese *H. auropunctatus* by their larger size, heavier build and slightly darker coloration, their superiority in size being especially well marked in their skulls and dentition.

The following are the comparative measurements of Mr. Oates's Pegu specimen, which I will consider as the type of the variety, and of the type of *H. auropunctatus* from Nepal, a fully adult male:—

	Head and body.		Tail.	Hind foot.
	mm.		mm.	mm.
<i>H. auropunctatus</i> , type ⁴ , ♂ ..	320		212	48
Var. <i>birmanicus</i> , ♂	392		214	55 ⁵

Skulls:—			Palate-		Incisors to	Basi-
	Length.	Breadth.	length.	breadth.	cross-line.	cranial axis ⁶ .
<i>H. auropunctatus</i> ,	59·0	30·0	33·0	19·5	23·0	23·0
Var. <i>birmanicus</i> ,	62·7	34·0	34·0	21·8	23·0	25·3

Teeth.—Greatest diameter of			Greatest breadth of pm ⁴ at right angles to greatest diameter.	
	pm ⁴	m ¹	m ²	
<i>H. auropunctatus</i> ,	7·0	5·9	3·0	3·2
Var. <i>birmanicus</i> ,	8·0	6·4	3·1	3·6

It is possible that this variety will hereafter have to be raised to

¹ The question as to whether this should be "*birmanicus*" or "*burmanus*" has given rise to much doubt. Roma makes *romanus* and therefore Burma should make *burmanus*, especially as Burma is undoubtedly the correct, and the French Birmanie an incorrect and corrupt form of the name. Unfortunately, however, not only have the French corrupted the word into Birmanie, but the Italians, to whom we must look as the representatives of the ancient Romans, have also made the same change, calling it "Birmania," whence "*birmanicus*," which I think we must accept as the nearest to the proper Latin for Burmese.

² Preliminary diagnosis in Ann. Mag. N. H. (5) xvii. p. 4. Jan. 1886.

³ P. Z. S. 1879, p. 665.

⁴ Measurements taken as explained, P. Z. S. 1882, p. 65, except that in deference to what is now becoming the common practice, I take the "length of skull" from the front of the premaxillæ to the basion, instead of to the back of the condyles.

⁵ In the Manipur specimen 58 mm.

⁶ Combined lengths of basioccipital and basisphenoid, not including prephenoid as accidentally stated before.

the rank of a species; but until series from intermediate localities are collected it would be unsafe to presume that the differences between the typical *H. auropunctatus* and this variety will not be bridged over.

Some of Dr. Anderson's specimens of *H. auropunctatus*¹ no doubt also belong to this Burmese race.

2. *HELICITIS PERSONATA*, Geof.

a. b. Manipur, 28/2 and 6/3/81.

Dr. Anderson² places this species as a synonym of *H. moschata*, Gray; but the most cursory examination either of the original figure or of that given by De Blainville, both referred to by him, would have shown him that it was really different, as the teeth are depicted of a size even larger than is found in either *H. nepalensis* or *orientalis*, the two usually recognized representatives of the large-toothed group, while *H. moschata* is the type of the small-toothed section of the genus.

The very large size of the teeth seems to be a character of the continental lowland race, in contrast to the comparatively small-toothed Nepalese and Javan forms, these having in their turn far larger teeth than the Chinese *H. moschata*. Whether now *H. nepalensis* and *orientalis* are even varietally distinct from each other I am very doubtful, but in any case *H. personata*, although coming from a more or less intermediate locality, is sufficiently distinct from both by its larger teeth and greyer colour, to merit specific separation.

The distribution and relations of these three races, *H. nepalensis*, *orientalis*, and *personata*, form an interesting comment on Mr. Wallace's remarks on the Himalayan, Javanese, and Malay faunas³.

3. *TUPAIA BELANGERI*, Wagn.

a. Aimole 11/4/81. *b.* Machi 1/5/81.

4. *PTEROPUS MEDIUS*, Temm.

a. ♂. Kotschim-kooleh, 7/4/81.

5. *VESPERUGO (VESPERUS) PACHYPUS*, Temm.

a. Aimole, 14/4/81.

This somewhat rare species has been found at isolated localities over nearly the whole of the Oriental Region.

6. *VESPERUGO ABRAMUS*, Temm.

a. Aimole, 14/4/81.

7. *SCIUROPTERUS ALBONIGER*, Hodgs.

a.-d. Machi, 4-10/5/81.

This species differs much more from *S. fimbriatus*, Gray, than is generally recognized. The shape and proportions of its skull and the colour of its incisors are markedly different, and it has no trace of the minute extra hind foot-pad characteristic of *S. fimbriatus*.

¹ *Op. cit.* p. 173.

² *Op. cit.* p. 193.

³ *Island Life*, p. 358 (1880).

I cannot agree with Dr. Anderson as to the identity of the genera *Pteromys* and *Sciuropterus*, which he has united on the plea that the dentition is much the same in both, and that the distichous arrangement is not purely distinctive of the smaller species, but is found partially in some of the larger, while, on the other hand, some of the so-called *Sciuropteri* really have bushy tails. He goes on to say, "The wing-parachute in all the members of the group is the same, although some naturalists have described it in *sagitta* as having an expansion in front of the fore limb which does not exist in the other species; but this is unquestionably an error."

In order to settle the question, I have examined specimens in spirit both of *Pteromys* and *Sciuropterus*, and I find that not only do *both* have an antebrachial membrane, arising from the back of the cheek and inserted in the front of the carpus, but that there really are important differences in the development and insertion of the parachutes, comparable in some respects to those observable in the wing-membranes of the Chiroptera, differences which, as in the case of the antebrachial membrane, Dr. Anderson must have overlooked through examining dried skins only.

In *Pteromys* there is a broad well-defined interfemoral membrane, inserted externally at the point where the *tendo achillis* is attached to the calcaneum, and internally to the tail from two to three inches from its base, and there is in some of the larger species nearly three inches depth of membrane clear of the hind limb.

On the other hand, in *Sciuropterus* there is either no interfemoral membrane at all, or what there is merely consists of a slight expansion of skin behind the knee, attached externally to the *tendo achillis*, about halfway down, and internally to the hinder side of the hips and *never involving any part of the tail*.

The lateral membrane also is distinctly narrower, especially below the knee, in *Sciuropterus* than in *Pteromys*, although the longer fringes of hair in the former hide this fact in dried specimens.

Adding to these differences the well-known one in the arrangement of the hairs of the tail, to which I am unable to see the exceptions mentioned by Dr. Anderson, and also those in the dentition described by various authors, I think that it will be admitted that two such natural groups as *Pteromys* and *Sciuropterus* should be allowed to stand as distinct genera.

8. *SCIUROPTERUS PEARSONI*. Gray.

a. Machi, 7/5/81.

This rare species would be naturally expected to occur in Manipur. It has previously been recorded from Sikkim, Assam, and Yunnan.

9. *SCIURUS INDICUS*, Erxl.

a. ♂. Gurung R. 8/2/81.

The present is by far the most easterly locality as yet recorded for this species, and extends its known range very considerably, the Terai region of Nepal (*Hodgson*) and Cuttack (*Anderson*) having

been hitherto its most easterly localities recorded. I am altogether unable to perceive on what grounds Dr. Anderson keeps *S. maximus*, Gm., separate from this, as although he gives detailed descriptions of both, he omits any comparison between the two. In my opinion the two are certainly specifically identical, and Dr. Jentink is also of the same opinion¹.

10. *SCIURUS ERYTHRÆUS*, Pall.

a-c. Noong-zai-bau, 2/2/81. *d.* Koomberong, 6/2/81.

e-i. Aimole, 13 to 19/4/81. *j, k.* Machi, 30/4 and 1/5/81.

Of these specimens all those from Noong-zai-bau and Koomberong are comparatively darker, both above and below, and more finely punctulated than any of those from Aimole and Machi, and more nearly approach the "*S. punctatissimus*" of Gray.

As all the first set were taken in February, and all the second in March, the difference, judging from Mr. Hume's series only, might have been suspected to depend on date and not on locality; but this idea is dispelled both by the absence of any patchiness or other sign of change in the skins, and by the fact that a specimen of *S. punctatissimus* in the Museum, from Cachar, is dated June, whereas, were the change seasonal only, this form should, on the evidence of the Manipur specimens, represent the winter and not the summer dress of *S. erythræus*.

The species seems, in fact, to be peculiarly susceptible to local influences, as every locality represented in the combined Museum and Hume collections has a more or less different race. Thus Bhotan and Western-Assam specimens are dark with a rufous tinging, an Eastern-Assam one pale with a yellowish wash, this leading naturally into the pale Aimole and Machi Manipur specimens. After these, again, comes the darker Noong-zai-bau and Koomberong race, which finally grades into the extremely dark, finely punctulated *S. punctatissimus* from Dilkoosha, Cachar.

11. *SCIURUS LOKRIOIDES*, Hodgs.

a-d. Machi, Aimole, and Phalel, 4/81. *e.* Jherighat, 1/2/81.

12. *SCIURUS LOKRIAH*, Hodgs.

a, b. Aimole, 4/81.

13. *SCIURUS MACCLELLANDI*, Horsf.

a-g. Aimole, 13-25/4/81. *h.* Machi, 7/5/81. *i.* Loanglol, 13/2/81.

These specimens are interesting as being almost precisely intermediate between the *S. macclellandi typicus* of Nepal and Assam, and the Tenasserim *S. macclellandi barbei*, Bly. *S. macclellandi swinhoei*, M.-Edw., of Moupin, Thibet², seems also to be a recognizable race of the present species.

S. macclellandi possesses six mammæ, one lateral and two inguinal pairs.

¹ Notes Leyd. Mus. 1883, p. 106.

² Rech. Mamm. i. p. 308 (1868-1874).

14. *MUS BOWERSI*, Anders.¹

a. ♀. Machi, 8/5/81.

There is nothing in Dr. Anderson's description of his *Mus bowersi* absolutely to prevent the present specimen belonging to it; but the differential characters of these *Muridae*, obvious enough on actual comparison, are often so difficult of description that I should not be surprised if the present were to turn out to be distinct from *M. bowersi*, especially as the figure of that animal is by no means identical with Mr. Hume's specimen, but is more similar to the species of the group to which *M. germaini*, M.-Edw., belongs. However, there can be no question that for the present the Manipur Rat should rather be referred to *M. bowersi* than be described as new. Dr. Anderson's type was obtained at Hotha, Yunnan, at an elevation of 4500 feet.

15. *MUS BERDMOREI*, Bly.

a, b. Kopum Thall, 11/2/81.

These two specimens agree so closely with Blyth's short description² that I have no hesitation in referring them to his species, even though Blyth himself afterwards placed *M. berdmorei* as a synonym of *M. robustulus*, Bly. (= *M. rattus rufescens*, Gr.), and though the locality of Blyth's specimen, Mergui, Tenasserim, is so distant and has so different a fauna from Manipur.

The following description, based on Mr. Hume's two skins, will serve to supplement the short and unsatisfactory one given by Blyth:—

General colour clear slaty grey, the tips of some of the hairs brown and of others white, the mixture giving a very finely grizzled appearance to the back, in which no trace of yellow or fawn is present; chin, chest, and belly pure white. Ears outside brown, inside silvery; feet white; tail bicolor, black above and white beneath for half its length, the terminal half white all round; the tip not pencilled.

Fur of only one sort, stiff and hispid, but with no trace of spines. Tail about the length of the head and body combined, or a little shorter. Ears large and evenly rounded; fifth hind toe reaching to the middle of the first phalanx of the fourth. Foot-pads large and prominent.

Skull with its facial portion unusually long, nasals long and narrow, surpassing in length the ascending premaxillary processes; supraorbital ridges well defined; anterior plate of zygoma well developed, very convex forward. Palate very long, the interval between the back of the incisors and the molars very much longer than usual; palatine foramina rather short, terminating about 1mm. in front of m^1 ; posterior nares opening at the level of the hinder edge of m^3 .

Incisors pale yellow, lightening to white at their tips, directed

¹ Zool. Yunn. Exp. p. 304, pl. xvii. (1878).

² J. A. S. B. xx. p. 173 (1852).

much more forward than usual. Molars very small in proportion to the size of the animal, their pattern as usual.

Measurements. Head and body 174 mm.; tail 172; hind foot 36; fore arm and hand 44; ear (above crown) 16; heel to front of last foot-pad 17.4.

Skull. Bregma to tip of nasals 35.0; greatest breadth 21.5; nasals, length 16.0; interorbital breadth 7.0; length of face 21.8; palate, length 22.4; incisors to m¹ 14.1; palatine foramina 7.8; molar series 6.1; anterior zygoma-root 4.7; lower jaw, bone only, 25.1; to incisor tips 30.6.

This species is allied to *Mus blanfordi*, Thos., and *Mus con-fucianus*, M.-Edw., but differs from both by its clear grey colour, without any trace of yellow in it, by its shorter tail, forwardly directed and paler-coloured incisors, longer palate, and smaller molars.

16. *MUS HUMEL*, sp. n.¹ (Plate V.)

a-f. 2 ♂ and 4 ♀. Moirang, 23/3/81.

The collection contains six specimens of this striking new species, which I have much pleasure in dedicating to the donor of the present magnificent addition to the National Collection of mammals.

General colour above exceedingly like that of *Golunda ellioti*, Gr., viz. coarsely grizzled grey, lightest on the head and gradually turning to deep rufous on the rump, the tips of the great majority of the hairs being white or yellowish white on the head and fore quarters, and gradually becoming rich rufous on the hind quarters, their bases in all cases deep slaty-blue. The other hairs are black throughout, and form the black element in the general grizzling. Sides like the fore quarters. Belly yellow or orange, mixed with the slate of the hair-bases; no black-tipped hairs below. The inner sides of the thighs and all round the base of the tail rich rufous.

The fur throughout is soft, and unmixed with flattened or spinous bristles.

Feet grizzled yellowish white. Ears thinly covered outside with black hairs, and inside with black and yellow or red ones; an indistinct tuft of orange-tipped hairs in front of the basal notch. Tail well haired, but not pencilled, markedly bicolor, the hairs black above and white below, but the scales, even of the lower side, are uniformly brown.

Ears large and evenly rounded, with a small projection in the middle of their inner margins; laid forward they reach to the posterior corner of the eye. Tail about as long as the body without the head. Fifth front toe unusually short, its claw barely reaching to the bottom of the division between the 2nd and 3rd toes, giving the foot, at first sight, the appearance of being only provided with three toes. Fifth hind toe reaching just to the base of the fourth. Foot-pads 5-6. Mammæ 8, 2 pectoral and 2 inguinal pairs.

Skull, both in size and shape, almost identical with that of *Golunda ellioti*², Gr., with the two following exceptions:—(1) The front

¹ Preliminary diagnosis published Ann. Mag. N. H. (5) xvii. p. 84, Jan. 1886.

² Figured by Blanford, J. A. S. B. xlv. pl. x. (1876).

edge of the anterior zygoma-root is concave, with an overhanging point¹ instead of being convex, (2) the palate is produced to behind the edge of the last molar, instead of ending opposite its centre. The first of these characters, although fairly common among the Australian Muridæ, is, to the best of my knowledge, not found in any of the other Muridæ either of Asia or Africa. In all other characters, in the development and direction of the supraorbital ridges, the length and shape of the nasals, the angles formed by the sutures on the brain-case, the length of the palatine foramina, &c., the two skulls are absolutely identical.

Teeth large and powerful; incisors short and stout, the lower ones projecting only about 3 mm. beyond the bone, smooth, rounded, and ungrooved in front, dark orange-yellow above, rather lighter below; molars broad and heavy, their structure as in *Mus*, and with no resemblance to those of *Golunda*; last molar nearly as large as the second, consisting both above and below of two well-defined equal-sized laminae.

Measurements of the largest skin, a female. Head and body 125 mm.; tail 106; hind foot 25.0. Of a specimen softened and placed in spirit, head and body 118.0: hind-foot 26.5; heel to front of last foot-pad 12.0; forearm and hand 31.5; ear, above crown, 12.0.

Skull. Length, bregma to nasal-tip 26.0; greatest breadth 15.0; length of face 14.5; nasals, length 10.0; interorbital breadth 4.5; palate, length 16.0; incisors to m¹ 8.3; palatine foramina 5.1; molar series 5.8; length of anterior zygoma-root 4.0; lower jaw, length (bone only) 18.3; to incisor-tips 19.2; projection of incisors (behind) 4.5.

The general appearance of this species is infinitely more like that of the Gulandi (*Golunda ellioti*) than that of any of the other Indian members of the genus *Mus*. So like *Golunda* is it, indeed, in colour, proportions, and even in the general shape of its skull, that it might easily be mistaken for this animal, were it not for its slightly longer tail, less spiny fur, ungrooved incisors, and a few other little prominent characters which might easily be overlooked by a superficial observer. It thus seems to bear the same interesting relationship to the Gulandi that *Sigmodon hispidus*, S. and O., does to *Rheithrodon alstoni*, Thos.²

The only species to be referred to in describing *M. humei* as new is *Mus erythrotis*, Blyth³, from the Khasia hills, the colours of which agree very closely with those of this species, but which is stated to be only 57 mm. in length, with a tail 60 mm. long, and a hind foot, including the claws, only 17.4 mm. long, a difference in size far too great to admit of any question as to the specific distinction of the two animals.

¹ This type of zygoma-root is figured Ann. Mag. N. H. (5) ix. p. 414, fig. 3 (1882).

² See P. Z. S. 1880, p. 693.

³ J. A. S. B. xxiv. p. 721 (1855).

17. *MUS CERVICOLOR*, Hodgs.

a. Boori-bazar, 11/3/81.

This is evidently Blyth's *M. cunicularis*¹ described from the Khasia hills, and bears out my suspicion that that is merely a synonym of *M. cervicolor*².

18. *VANDELEURIA OLERACEA*, Benn.

a, b. Boori-bazar, 11/3/81.

Dr. Anderson (Zool. Yunn. Exp. p. 313, 1878) has already noted the presence of this interesting little species in Burma and the neighbouring countries. It seems probable that *Mus badius*, Blyth (J. A. S. B. xxviii. p. 295), described from the valley of the Sitang, should be added to the synonyms of *V. oleracea*.

19. *RHIZOMYS BADIUS*, Hodgs.

a-f. 4 adult and 2 young. Boori-bazar, 11 and 12/3/81. *g, h.* 2 young, Moirang, 22/3/81.

The young specimens are interesting as showing that this species only assumes its rich chestnut-colour in adult age, as they are all of a hue more resembling that of *Rh. pruinus*, Bly., than that of the adult animals along with which they were caught, and of which they are presumably the young.

III. THE TENASSERIM COLLECTION.

Next in interest to the Manipur mammals come those from Tenasserim, collected nearly entirely by Mr. Davison in 1877 and 1878, at the time when Mr. Hume was bringing together materials for the valuable paper on the Birds of Tenasserim published in 1878³. In this paper may be found a description (p. 522) of all the localities at which Mr. Davison worked, and at which therefore these mammals were obtained. It was on this collection that Mr. Blanford's paper "On some Mammals from Tenasserim"⁴ was based, and in the present account there are therefore no novelties to be described, that author having then named, described, and figured the two remarkable species *Prionodon maculosus* and *Sciurus rufigenis*, the typical specimens of which are in Mr. Hume's collection. As Mr. Blanford's paper is not, however, a full account of the collection, but merely consists of notes on the rarer and more interesting species, I have considered it advisable, notwithstanding his paper, to write a list of the Tenasserim as well as of the other mammals of the Hume collection.

Tenasserim mammals are of interest chiefly on account of the passage that takes place in that country from the Burmese to the Malay fauna, as we find that the South Tenasserim species, those from Bankasun, are more or less Malay in character, and add several species to the list of the mammals of British India, while on the

¹ J. A. S. B. xxiv. p. 721 (1855).

² P. Z. S. 1881, p. 548.

³ 'Stray Feathers,' vol. vi. 1878.

⁴ J. A. S. B. xlvii. p. 150 (1878).

other hand those of North Tenasserim are nearly entirely Burmese, although but few of them, again, are the same as the species found still further north in Manipur.

The careful and conscientious manner in which Mr. Davison's collecting and labelling is done is nowhere more conspicuous than in the beautiful series obtained by him in Tenasserim, so that the number and excellence of the skins, and above all, the careful preservation of the dates of capture, have been to me, and I hope will be to others, of the greatest possible service in making out the problems of distribution, and of local, sexual, and seasonal variation.

The collection contains 86 specimens, referable to 25 species.

1. *HYLOBATES LAR*, L.

a, *b*. Myawadi¹. *c*. Kankaryit, 13/1/77. *d-g*. Bankasun, 4-6/77.

2. *SEMNOPITHECUS FEMORALIS*, Horsf.

a. Bankasun, 15/4/77.

This rare species forms an addition to the fauna of Tenasserim, the few localities as yet recorded for it being all either in the south of the Malay peninsula or in Sumatra. Mr. Davison's specimens precisely agree with Horsfield's type preserved in the Natural History Museum.

3. *SEMNOPITHECUS OBSCURUS*, Reid.

a, *b*. 5000', Mt. Mooleyit, 30/1/77. *c*. Foot of Mt. Nwa-la-boo, Tavoy, 10/4/78. *d*. Bankasun, 25/5/77.

Specimen *d* is a very remarkably coloured individual differing from all others that I have seen in having its crest, nape, arms and legs, and tail yellow, contrasting markedly with the dark hues of the face, body, and feet. It is, however, led up to by a specimen in the Museum from Malacca, collected by Dr. Cantor², which has its crest yellow and its limbs and tail lighter than usual. I am therefore indisposed at present to look upon the Bankasun specimen as more than an individual variety. It must, however, be mentioned that its auditory bullæ are larger and more projecting, and its teeth smaller than is usually the case; but with only a single specimen, these characters are not sufficiently tangible to found a new species upon.

4. *MACACUS CYNOMOLGUS*, L.

a. Wimpong, Thatone.

5. *PRIONODON MACULOSUS*, Blanford.

a. Bankasun (co-type of species. Figured J. A. S. B. xlvii. pl. vi. 1878).

This is the original skin described and figured by Mr. Blandford,

¹ Specimens to which no collector's name is attached were obtained by Mr. Davison.

² No. 79. 11. 21. 596.

while the spirit specimen from Moulmein, mentioned at the same time, has already been generously presented to the National Collection by him.

6. *PARADOXURUS HERMAPHRODITUS*, Pall.

a. Wimpong, Thatone.

As Mr. Blanford has shown (*P. Z. S.* 1885, p. 794), Pallas's *P. hermaphroditus* should be referred to the common Malay Palm-civet, which has hitherto been known either as *P. musanga*, Raff., or *P. fasciatus*, Gr.

7. *MUSTELA FLAVIGULA*, Bodd.

a. Mt. Nwa-la-boo, Tavoy, 7/4/78. *b.* Bankasun, 20/6/77.

8. *GYMNURA RAFFLESI*, Vig. and Horsf.

a. Bankasun (Blanford, *tom. cit.* p. 150).

Its only known occurrence within British India.

9. *TUPAIA BELANGERI*, Wagn.

a-h. various localities, Tenasserim.

This is the *T. peguana*, of Mr. Blanford's list. It may generally be distinguished from the next species by the presence of a well-developed internal cusp on its second upper premolar.

10. *TUPAIA FERRUGINEA*, Raff.

a. Bankasun, 27/4/77. *b, c.* Tenasserim.

11. *PTEROPUS MEDIUS*, Temm.

a. Amherst, near Moulmein.

This appears to be about as far south-eastwards as this species has been recorded, its place further south being taken by *Pt. edulis*, Geoffr.

12. *RHINOLOPHUS TRIFOLIATUS*, Temm.

a, b. Mergui (Hume).

It is important to have additional localities for this rare species, of which the exact range is by no means satisfactorily settled.

13. *PTEROMYS CINERACEUS*, Bly.

a. Wimpong, Thatone, 21/12/76. *b.* Kankaryit.

This species seems to be hardly more than a geographical race of the well-known Indian Flying-squirrel (*P. petaurista*, L.). The measurements of *a* were published by Mr. Blanford (*l. c.* p. 165).

14. *SCIURUS BICOLOR*, Sparrm.

a, b. Thoungyah, 26 and 30/9/78 (Darling). *c.* Mergui, 10/1/79. *d, e.* Bankasun, 18/3/77 and 3/6/77.

No seasonal change is appreciable among the large series of this species in the Tenasserim and Malayan collections.

15. *SCIURUS CANICEPS*, Gray.

a, b. Moulmein. *c.* Kankaryit, 13/1/77. *d, e.* Thoungyeen River, 9 and 10/77 (Bingham). *f, g.* Thoungyah, 16/1/77 (Davison), 10/10/78 (Darling). *h.* Myawadi, 2/10/77 (Bingham). *i.* Tavoy, 16/3/78. *j-l.* Bankasun, 6/77 (*S. phayrii*, Bly.). *m, n.* Pahpooon, W. Tenasserim. *o.* Thatone, 23/11/77.

This fine series, with the seven Malayan specimens from Kussoom, (27/5/79), Taroar (12/2/79), Poongah (8/79), and Salanga (2 and 3/79), collected by Darling, form an invaluable addition to the material for making out the relations, variation, and distribution of this troublesome species and its allies.

Dr. Anderson, although he gives separate headings in his monograph to *S. pygerythrus*, *caniceps*, *phayrei*, *blanfordi*, and *griseimanus*, states that he believes that they are all closely related to one another and should not perhaps be specifically separated.

On laying out, arranged as it were on an imaginary map, the whole available series of skins, 70 in number¹, belonging to the above species, one is able to make out five recognizable forms grading into each other in various degrees, of which two occur in North Tenasserim, one in Pegu and Upper Burma, another in Cambodja and Cochin China, and the fifth in S. Tenasserim and N. Malaysia; but anything more complicated than their inter-relations it is hard to conceive, and they seem to be only definable by a free use of trinomial nomenclature.

As the easiest method of explaining their relationships I will attempt to trace out the history of *S. caniceps*, which appears to have been something as follows:—

The original of the species, occurring about the centre of the present range, would be such an animal as summer non-breeding specimens of the true *S. caniceps* of N. Tenasserim now are, viz. grizzled yellowish grey above and grey below, the sides of the neck and the sides of the belly being more or less tinged with yellow (85. 8. 1. 177²). The struggle for existence then necessitated a richer ornamentation, at least in the breeding-season, and this was accomplished in various ways in different parts of the animals' range. North-western specimens, those of Burma and Pegu, became rich yellow underneath (*S. pygerythrus*, 81. 12. 2. 7), and eastern ones, in Cambodja &c., a duller yellow below, with whitish feet (*S. griseimanus*, 78. 6. 17, 29), both forms having occasionally, presumably by atavism, ordinary grey-bellied specimens, *e. g.* 81. 12. 2. 9 from Pegu and 62. 8. 16. 4 from Laos. Southwards, beginning about at Tavoy, and reaching down to Malacca, the yellow tinge of the sides of the neck and belly were replaced by rich orange-red,

¹ Of these, 22 belong to the Hume, 25 to the old Museum collection, and 23 have been kindly lent to me by Mr. Blanford out of his own collection.

² These numbers are those of the registers in the Natural History Museum, and will always identify the particular phase of fur referred to.

forming a very handsome ornamentation (82. 3. 9. 5, Junkceylon). This race represents *S. concolor*, Bly.¹

These three forms are all without any marked seasonal change of colour; but in the next race, which is the original stock living in N. Tenasserim, an entirely different sort of ornamentation has been set up in the form of the assumption, during the rutting-season only, of a brilliant orange-yellow back, the sides and belly still remaining dull grey (*S. caniceps typicus*, 85. 8. 1. 178).

Further to complicate matters, the north-western yellow-bellied race (*S. caniceps pygerythrus*) has again spread southwards and overlapped the range of *S. caniceps typicus*, which, being now provided with a highly specialized seasonal change of colour, has driven it to adopt a still further development of its own form of ornamentation, namely, the production of a dark brown stripe between the upper grey and the lower yellow, which shows up the latter in the most brilliant manner possible (*S. phayrei*, 85. 8. 1. 175, Thatone).

The original grey *S. caniceps* has thus, except in the unornamented summer race of var. *typicus*, become entirely extinct, and has been replaced by its variously decorated offshoots.

With regard to nomenclature I think it is impossible to express the present state of things in a binomial manner, but by using the following trinomials we may perhaps approach more closely to the truth:—

*S. CANICEPS PYGERYTHRUS*², Geof.

(*S. blanfordi*¹, Bly.)

No seasonal change; belly yellow.

Burma and Pegu.

S. CANICEPS PHAYRII, Bly.

No seasonal change; belly rich orange, with brown lateral stripes.

Pegu and N. Tenasserim.

S. CANICEPS GRISEIMANUS, M.-Edw.

(*S. inornatus*, Gr., *S. leucopus*, Gr.)

No seasonal change. Belly pale yellow. Feet white. Black tail-tip nearly obsolete.

Cambodja &c.

¹ J. A. S. B. (xxiv. p. 474, 1855), apud Blandford (J. A. S. B. xlvii. p. 161, 1878), who in describing the present series of Bankasum specimens belonging to this form says, "These dark olivaceous forms may perhaps be sufficiently distinct to constitute a local race for which Blyth's name *S. concolor* may be retained, but they are not, I think, really separable from *S. caniceps*." Anderson, on the other hand, places *S. concolor* as a synonym of *S. modestus*, without any remark; but pending a renewed examination of the type, I prefer to take Mr. Blandford's authority, as this course enables me to avoid giving the southern race a new name.

² The full references to all these names will be found in Dr. Anderson's 'Monograph,' pp. 227-253.

S. CANICEPS TYPICUS.(*S. chrysonotus*, Bly.)

A seasonal change. In summer all grey, in winter back brilliant orange-yellow.

N. Tenasserim.

S. CANICEPS CONCOLOR, Bly.

No seasonal change. Sides of neck and of belly rufous, dull in northern, brilliant in southern specimens.

S. Tenasserim to Malacca.

The alternatives, under the binomial system, of either splitting this species into five, or of lumping all the varieties under one head, are both too unsatisfactory for adoption. For the first there are far too many intermediate specimens and gradations, and for the second the differences between fully ornamented specimens of *S. phayrei*, of *S. concolor*, and of breeding specimens of *S. caniceps typicus*, are infinitely too striking.

The manner and dates of the seasonal change in *S. caniceps typicus* are well illustrated by the series from N. Tenasserim. In October the yellow begins to appear in small patches on the back among the grizzled grey (85. 8. 1. 184). By November the whole of the back is rich yellow (85. 8. 1. 182), and this remains at its best until January¹, and then gradually becomes duller and dirtier-looking (77. 10. 25. 2), until about March the summer grizzled grey hairs begin again to appear in patches in the midst of the yellow (77. 10. 25. 1), and soon entirely supersede it. Males and females alike go through this change.

16. *SCIURUS ATRODORSALIS*, Gray.

- a.* Kankaryit, near Moulmein, 10/1/77. *b.* Doonsa, near Moulmein, 8/3/77. *c, d.* Lathorge, near Myawadi, 19 and 22/1/77. *e.* Maitho, Thoungyeen R. 29/10/77 (*Bingham*). *f, g.* Mt. Nwa-la-boo, Tavoy, 5/4/78.

The evidence of the fine series before me, consisting of 40 specimens², tends to show that the variation in the colour of this species is not so much a sign of season as of locality, southern specimens being, as a rule, more rufous and generally without the black back.

It unfortunately happens, however, that nearly all the dated specimens that I have seen were obtained in the winter, when the black back is certainly present in most cases. However, Capt. Beavan³ has described a July specimen as having a black back, and

¹ One specimen in Mr. Blanford's collection, labelled as from Thatone, January, has no yellow on its back as might be expected, and forms therefore a striking exception to the general rule. It should be noticed, however, that this is the very specimen of which Mr. Blanford wrote in 1878 (*J. A. S. B.* xlvii. p. 162), "The skin so precisely resembles the peculiarly dark olive specimens from Bankasun, that I am inclined to suspect the label must have been changed by accident."

² Many of these were kindly lent to me by Mr. Blanford.

³ *P. Z. S.* 1866, p. 428.

therefore this character cannot be merely a sign of the rutting-season, as I had originally suspected.

17. *SCIURUS RUFIGENIS*, Blanf.

a. 5500', *b.* 6300', Mt. Mooleyit, 1/2/77 and 31/1/77 (Cotypes of species).

I have nothing to add to Mr. Blanford's excellent description of this species. There can be no doubt that it is, as he suggests, nearly allied to *S. pernyi*, M.-Edw., but it may easily be distinguished by its brilliant red cheeks, that species having them grey like the back. The unusual length of the muzzle is equally found in both, and together they seem to lead from the ordinary Squirrels towards the still longer-nosed *Rhinosciurus* of Gray. It is, of course, quite natural that if the Tibetan *S. pernyi* were represented in Tenasserim, it would be by a species living at the considerable altitudes at which alone *S. rufigenis* has been found.

18. *SCIURUS BERDMOREI*, Blyth.

a, b. ♀. Myawadi, 18 and 20/1/77.

I cannot share the doubts expressed by Mr. Blanford¹ as to the identity of these specimens with the true *S. berdmorei*. Although the markings differ in their intensity, their general plan and disposition is precisely the same in the two forms represented by the names *S. berdmorei* and *S. mouhoti*, Gr. It has also a remarkably long and narrow muzzle, very nearly as much as in *S. rufigenis*, a point which has apparently never been noticed before.

19. *SCIURUS MACCLELLANDI BARBEI*, Bly.

a. ♂. 9/2/77 (*Bingham*). *b, c.* Thoungyah, 11/10/78 (*Darling*). *d.* Myawadi, 18/1/77. *e.* Kankaryit, 12/1/77. *f-i.* Tavoy, 3 and 4/78. *j.* Bankasun, 1/6/77.

20. *MUS RATTUS RUFESCENS*, Gray.

a. Moulmein, 8/3/78.

The *Mus robustulus* of Blyth, as Mr. Blanford has suggested, is identical with this, the common Tree-rat of the whole of India.

21. *RHIZOMYS BADIUS*, Hodgs.

a. Thatone.

This seems to be the first recorded occurrence of *R. badius* in Tenasserim, though Blyth's specimens of the so-called "*R. castaneus*" came from Arrakan and Pegu.

22. *ATHERURA MACRURA*, L.

a. Thoungyah, 3/10/78 (*Darling*).

23. *TRAGULUS NAPU*, Raff.

a-d. Bankasun, 5 and 6/77.

¹ J. A. S. B. xlvii. p. 162 (1878).

24. *TRAGULUS KANCHIL*, Raff.

a-c. Bankasun, 5 and 6/77.

Mr. Blanford¹ has fully described the differences between the two Tenasserim species of Chevrotain.

25. *MANIS JAVANICA*, Desm.

a. Bankasun, 1/75.

IV. THE MALAY PENINSULA COLLECTION.

The mammals from the Malay Peninsula are 105 in number, and belong to 28 species, of which no less than 13 are Sciuridæ, a group always well represented in collections made by ornithologists. As in the case of the other series, the greater part of this set were collected by Mr. Davison, although some few were obtained by Mr. J. Darling at Salanga and on the mainland adjoining, and by Mr. Syers in Salangore.

As might be expected, these specimens, while of considerable value in fixing the northward and southward distribution of the species along the narrow Malay peninsula, belong for the most part to common species. There is, however, among them a specimen representing a beautiful new species of *Sciuropterus*, which I have dedicated to its discoverer, Mr. Davison, and there are many which render important service in contributing additional information as to the exact localities and other particulars about the species to which they belong.

The only previous paper of any importance on the mammals of this district is that published by Dr. Theodore Cantor in 1846², which gives a complete list of the species then known to occur in the "Malay Peninsula and Islands," but which, excellent as it is for the date at which it was written, is now, of course, somewhat obsolete, and would well bear the addition of such information as may be gleaned from Mr. Hume's valuable collection.

Many of the localities at which the collection was obtained are referred to or described in the two following papers:—

A. O. HUME. "A First Tentative List of the Birds of the Western Half of the Malay Peninsula," 'Stray Feathers,' viii. p. 37, 1879.

A. O. HUME. "The Birds of the Western Half of the Malay Peninsula, Second Notice, *tom. cit.* p. 151.

1. *SEMNOPITHECUS FEMORALIS*, Horsf.

a. Klang, Salangore, 25/7/79³.

2. *SEMNOPITHECUS SIAMENSIS*, Müll. & Schl.

a. "Interior of Malay peninsula, beyond Klang." 4/79.

A curious whitish specimen, far paler than usual, but apparently

¹ *Tom. cit.* p. 166.

² J. A. S. B. xv. pp. 171 and 241.

³ As in the last list, all specimens to which no name is appended were collected by Mr. Davison.

not specifically different from Cantor's specimens of *S. albocinereus*, which Dr. Anderson has shown to be identical with *S. siamensis*.

3. NYCTICEBUS TARDIGRADUS, L.
a. Salanga, Junkceylon, 19/2/79 (*Darling*). b. Malacca, 7/77.
4. HEMIGALE HARDWICKEI, Gray.
a. ♂. Jaffaria, Johore, 20/3/80.
5. PARADOXURUS HERMAPHRODITUS, Pall.
a. Salanga, 27/2/79 (*Darling*). b. ♀. Klang, 4/3/79.
6. ARCTOGALE LEUCOTIS, Blyth.
a. ♂. Salangore, 2/11/79 (*Syers*).
7. PUTORIUS NUDIPES, F. Cuv.
a. ♂. Klang, 18/4/79.
8. GALEOPITHECUS VOLANS, L.
a, b. Ding-diug Islands, S. of Pinang, 3/79. c. Malacca, 9/75.
9. CROCIDURA MURINA, L.
a. Singapore, 7/77.
10. TUPAIA FERRUGINEA, Raff.
a, b. Malacca, 9/75. c. ♂. Jelang, Salangore, 24/6/79.
11. TUPAIA JAVANICA, Horsf.
a. Salangore, 17/11/79 (*Syers*). b. Johore, 8/75.
12. PTEROPUS EDULIS, Geof.
a, b. Klang, 3 and 8/79.
13. CYNOPTERUS MARGINATUS, Geof.
a. Jerome, Salangore, 12/8/79. b. Singapore island, 3/2/79.
14. PHYLLORHINA DIADEMA, Geof.
a. Gunnong Pulai, Johore, 7/3/80.
15. PHYLLORHINA BICOLOR, Temm. (?).
a. ♂. Klang, Salangore, 13/7/79.
This specimen has more pointed ears, a broader horizontal nose-leaf, and a much more largely developed projection between the nostrils than is usually the case in this species; but without seeing specimens properly preserved in spirit I do not care to describe it as new.
16. PTEROMYS NITIDUS, Desm.
a. ♂. Klang, Salangore. b. ♂. Malacca, 7/77. c. Gunnong Pulai, Johore, 7/3/80.

These specimens all belong to the so-called species *Pt. melanotis*,

Gr., which Dr. Anderson, in his Monograph of the genus¹, keeps separate from *Pt. nitidus*, although he described an intermediate specimen seen by him in the Leyden Museum. As the two forms are not geographically separate, and their skulls are quite identical, I do not think there is sufficient difference in their colour to distinguish them from one another, even as varieties.

17. *PTEROMYS TEPHROMELAS*, Günth.

a. ♂. Klang, Salangore, 27/8/79. b. ♀. Jaffaria, Johore, 18/3/80.

These two specimens are of value as showing that the characters of the fully adult animal are practically the same as those of the young specimen described by Dr. Günther. The colours and proportions are almost identical, the only difference I can see being that the shining black hairs on the back are somewhat longer and more prominent in the adult, thus giving a less woolly appearance to the whole animal. The skull of the adult also shows that the species is distinguished by the very small relative size of its molars. The measurements of the male specimen are as follows:—Head and body 330 mm., tail 365, hairs at tip 50, hind foot 73, forearm and hand 148, ear, above crown (shrunk) (c) 25.0.

Skull:—Occiput to tip of nasals (c) 64, length of face 30.7; greatest breadth 42; nasals, length 18.6, breadth 11.4; interorbital breadth 15.0; palate, length 32.8, breadth outside m² 16.0, inside m² 8.0; diastema 16.0; palatine foramen 5.0; molar series (exclusive of pm¹) 12.0; lower jaw, bone only, 41.5; to tip of incisors 45.0.

18. *SCIUROPTERUS DAVISONI*, sp. n.² (Plate VI.)

a. Malacca³, 7/77.

General colour above much as in *S. pearsoni*, Gr., viz.:—dark slaty grey, with the tips of the hairs bright rufous orange. Parachute similar to back, its edges, especially along the supporting cartilage, rich orange. Below the belly is pale orange, the orange becoming deeper and richer to the edges of the parachute; no intermixture of slate except on the parachute just above the hips. Feet and ears brown. Tail markedly distichous, dark brown above, rich rufous orange below, the latter colour showing somewhat on the upper surface between and beyond the brown hairs.

Ears large, naked, triangular, obtusely pointed, their greatest breadth nearly or quite equal to their height above the crown of the head. Hind feet slender, unfringed, their soles provided with one proximal and four distal well-defined foot-pads.

The skull of the type is unfortunately very imperfect, but there is enough to show that it is distinguished from that of *S. pearsoni* by its broader interorbital space, more heavily built muzzle, broader

¹ Zool. Yunn. Exp. p. 292.

² Preliminary Diagnosis, Ann. & Mag. N. H. (5) xvii. p. 84, Jan. 1886.

³ The following note is written on the back of the label of this specimen:—
"This species occurs also in Tenasserim. Seen near Myawadi by Davison."

and darker-coloured incisors, and longer and narrower molars. From that of *S. lepidus* it differs by its much larger size in every way, and its stouter and more powerful teeth. From both also it differs by not possessing any trace of the minute first upper premolar generally present in the genus, a character usually fairly constant in the true Squirrels, but on which too much stress must not be laid on the evidence of a single specimen only.

Measurements (of a skin and therefore merely approximate):—Head and body 142, tail 172, hairs at end 23; hind foot 36; heel to front of last foot-pad 16; ear (above crown) 18·5.

Skull. Length of face¹ 23·0, greatest breadth (c) 30·0, interorbital breadth 11·2, tip to tip of postorbital processes 18·0; nasals, length 14·1, breadth 7·0; diastema 11·5; palate, length 23·8, length of molar series 9·5, breadth across palate outside m¹ 9·7, inside 5·1.

This beautiful little species reminds one superficially both of *S. pearsoni*, Gr., and *S. lepidus*, Horsf., with the latter of which I consider *S. spadiceus*, Bly., should be amalgamated. From *S. pearsoni* it differs in its broader, naked, and untufted ears, and its longer and more distinctly distichous tail, while from *S. lepidus* it is distinguished by its larger size, much larger and broader ears, orange instead of brown parachute, clear instead of slate-mixed belly, and by the brilliant orange of the underside of its tail.

S. sagitta, Linn., which Dr. Anderson was unable to identify, seems to me to be unquestionably the species commonly known as *S. horsfieldi*, Waterh., the original description agreeing in almost every respect, and the locality being the same. The differences between *S. sagitta* and *S. davisoni* are too obvious to need pointing out.

It is with the greatest pleasure that I take the opportunity of naming this beautiful species after my friend Mr. W. Davison, the collector of the greater part of the Hume mammals, and to whose powers of observation and collection, the sciences of ornithology and mammalogy are so largely indebted. Mr. Davison obtained himself for Mr. Hume nearly the whole of the Tenasserim and Malay peninsula collections, and also the whole of the specimens from Simla and from S. India presented with them.

19. *SCIURUS BICOLOR*, Sparrm.

a, *b*. Salanga, Junkceylon, 2 and 3/79 (Darling). *c*. Dingding R. 24/2/79. *d-g*. Klang. *h*. Malacca, 9/75. *i*. Jaffaria, Johore, 17/3/80. *j-l*. Gunnong Pulai, Johore, 7 & 8/79.

With the exception of three or four of the cream-coloured examples so common in this species, all these specimens represent the typical black and yellow *S. bicolor*. This Squirrel has six mammæ, all in the inguinal region.

¹ From the tip of nasals to a point on the forehead above the constriction between the cerebral and olfactory chambers. The "length of brain-case," when given, is from the same point backwards to the most posterior point of the interparietal bone.